What is Claimed Is:

1. A method for segmenting a small feature in a multidimensional digital array of intensity values in a data processor, the method comprising:

computing an edge metric along each ray of a plurality of multidimensional rays originating at a local intensity extreme;

identifying a multidimensional edge point corresponding to a maximum edge metric on each said ray;

labeling every point on each said ray from said local extreme to said edge point; and

labeling an unlabeled point if the unlabeled point is adjacent to a labeled point and the unlabeled point has a more extreme intensity than the labeled point and the unlabeled point is closer than the labeled point to the local extreme.

2. The method of claim 1 wherein intensity is a vector of values and an edge metric is a magnitude of a vector difference in intensities between two points along each said ray divided by a multidimensional distance between the same two points.

3. The method of claim 1 further comprising additionally labeling an unlabeled point if the unlabeled point is adjacent to a labeled point and has a more extreme intensity than the labeled point and is no farther from the local extreme than the sum of a distance from the labeled point to the local extreme plus an expansive tolerance distance less than the spacing between adjacent points.

4. The method of claim 3 wherein

an expected size of a small feature is twice an integral number N times a spacing distance between adjacent points in the array,

N is greater than 1,

the maximum value of the difference in distances between the labeled point and the unlabeled point to the local extreme (Gmax)= $-N + \sqrt{(N^2 + 2)}$, and

the expansive tolerance distance is less than about Gmax.

5. The method of claim 1 further comprising also labeling an unlabeled point if the unlabeled point is adjacent to a labeled point and the unlabeled point has a less extreme intensity than the labeled point and the unlabeled point is closer than the labeled point to the local extreme by an inclusion tolerance distance.

6. The method of claim 5, wherein the inclusion tolerance distance is about a spacing distance between adjacent points in the array or more.

7. The method of claim 1, wherein the edge metric at a ray point along each ray is computed as the quotient of the absolute value of an intensity difference between the local extreme and the ray point divided by the absolute value of a distance between the ray point and the local extreme.

8. The method of claim 1, wherein a ray length of each said ray is scaled by an expected size of a small feature.

9. The method of claim 1, wherein

the local intensity extreme is a point with the maximum intensity among a subarray of the multidimensional digital array of intensity values, the subarray having a certain multidimensional size, and

the intensity of the local intensity extreme exceeds a bright threshold intensity.

10. The method of claim 9, wherein the certain multidimensional size is an expected size of a small feature.

11. The method of claim 1, wherein

the local intensity extreme is a point with the minimum intensity among a subarray of the multidimensional digital array of intensity values, the subarray having a certain multidimensional size, and

the intensity of the local intensity extreme is less than a dark threshold intensity.

12. The method of claim 11, wherein the certain multidimensional size is an expected size of a small feature.

13. The method of claim 1, wherein the multidimensional array is a digital image, and each point is a pixel.

14. The method of claim 13, wherein the digital image is a digitized mammogram and the small feature is a microcalcification candidate.

15. The method of claim 13, wherein the digital image is a video frame of a military scene and the small feature is a candidate target of a firing system.

16. The method of claim 1, wherein said labeling continues until no further unlabeled point can be labeled.

17. The method of claim 16, further comprising relabeling a labeled point as a feature edge point if an adjacent point is an unlabeled point.

18. The method of claim 17, further comprising joining a plurality of small features into a composite feature when a feature edge point from one small feature of the plurality of small features is within a join distance of a feature edge point of another small feature of the plurality of small features.

19. A data processing apparatus for segmenting a small feature in a multidimensional digital array of intensity values comprising:

an input for a plurality of intensity values arranged along regular increments in each of a plurality of dimensions;

a memory medium for storing the plurality of intensity values as a multidimensional digital array;

a processor configured to detect a local intensity extreme in the multidimensional digital array, to identify points along a plurality of rays originating at the local intensity extreme, to identify one edge point on each ray of said plurality of rays, said edge point associated with a maximum edge metric along said ray, to label each point on each ray from the local intensity extreme to the edge point, and to label an unlabeled point adjacent to a labeled point if the unlabeled point has a more extreme intensity than the labeled point and the unlabeled point is closer than the labeled point to the local extreme until no more unlabeled points can be labeled; and

an output for providing the labeled points for subsequent processing.

20. The apparatus of claim 19, wherein the plurality of intensity values arranged along regular increments in each of a plurality of dimensions is at least one digital image, and each point is a pixel.

21. The apparatus of claim 20, wherein the digital image is a digitized mammogram and the small feature is a microcalcification candidate.

22. A computer program product for segmenting a small feature in a multidimensional array of intensities using a computer, comprising

a computer readable memory medium

computer controlling instructions, stored on the memory medium, for configuring a computer to compute an edge metric along each ray of a plurality of multidimensional rays originating at a local intensity extreme, to identify a multidimensional ray edge point corresponding to a maximum edge metric on each said ray, to label every point on each said ray from said local extreme to said ray edge point, and to label an unlabeled point if the unlabeled point is adjacent to a labeled point and the unlabeled point has a more extreme intensity than the labeled point and the unlabeled point is closer than the labeled point to the local extreme.

23. A computer program product for segmenting a small feature in a multidimensional array of intensities using a computer, comprising

electronic signals transmitted over at least one communication line; and

computer controlling instructions, transmitted via the electronic signals, for configuring a computer to compute an edge metric along each ray of a plurality of multidimensional rays originating at a local intensity extreme, to identify a multidimensional edge point corresponding to a maximum edge metric on each said ray, to label every point on each said ray from said local extreme to said edge point, and to label an unlabeled point if the unlabeled point is adjacent to a labeled point and the unlabeled point has a more extreme intensity than the

labeled point and the unlabeled point is closer than the labeled point to the local extreme.